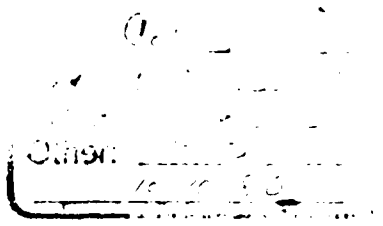
Bill Keffer

TENTATIVE SCHEDULE COLLIS

UHWS INVESTIGATION

Arrive Clinton, Iowa	Sunday November 16, 1980	
Team Briefing	Monday November 17, 1980	8:00 A.M.
Off Site Recon	Monday November 17, 1980	9:00 A.M.
Meeting with Collis Corp on site	Monday November 17, 1980	10:00 A.M.
Begin Inspection & Sampling	Monday Afternoon	
Close out Inspection/Debriefing	Monday Afternoon	4:00 P.M.



E P A PROJECT

ECOLOGY AND ENVIRONMENT, INC.

MEMORANDUM: REGION VII COST CENTER EP 152-7

O: Jim Buchanan & Ken

ROM: John Zirschky

ATE: 10-10-80

UBJECT: Collis Manufacturing, Clinton, Iowa

Collis Manufacturing fabricates and chrome plates refrigerator trays. he wastes from this operation have been found to contain zinc, chrome, ron and cyanide both in the sludge and effluent water from the plant. ast week, the IDEQ recieved a complaint from a contractor for Collis egarding the waste sludge. This person and several other people were nvolved in removing the sludge from the evaporation or drying bed so hat the waste could be taken to a landfill for disposal. After about a /2 hour of this operation, the workers noticed a strong ammonia smell. ithin two hours, the workers began to develop nausea and headaches. The orker called IDEQ to see if IDEQ knew what caused the illnesses and what he workers should do. IDEQ referred the matter to the Iowa Labor Dep- rtment and to EPA EP&R. As best as I can determine, FIT personnel are o inspect Collis Company and determine if the wastes are a threat to ealth and environment. A brief background review of Collis Co. waste reatment practices is presented so that we will be familar with the astes at Collis and can identify the proper safety precautions.

The chromium wastes are treated in a two-step process. First, exavalent chromium is reduced to try valent chromium using sulfur dioxide nd HCl.

Then, the pH of the waste is raised to approximately 8.5 using lime. This step precipitates the chrome as chromium hydroxide. A polymer is used to increase the precipitate settling rate.

The cyanide wastes are treated using a two step alkaline chlorination process. Chorine is used to oxidize the cyanide to cyanate. The pH is then raised to about 9.5 or 10 where upon the cyanide decomposes into carbon dioxide and nitrogen.

A clarifier is used to remove suspended particles or precipitates. The supernatent from this clairfier is filtered through a diametaceous earth filter to remove any remaining suspended solids. The effluent from the filter is discharged into a neaby creek. The settled sludge is placed in a filter press to concentrate the settled sludge to 35% solids. Then, the sludge is apparently placed into drying beds for further water reduction. Approximately 30 cubic yards/week of sludge is generated by this treatment process.

After sufficient water has evaporated from the sludge, it is removed from the drying beds and taken to a landfill. It was during this process, that the workers were affected. Sample data from EPA shows that cyanide is present in the waste sludge in concentrations of 0.20ppm. Hydrogen cyanide may be produced in these beds by a reaction with an acid or with water which could explain the workers symptoms. The acid which might create hydrogen cyanade. Also, hydrogen cyanide has an almond odor and not an ammonia odor. Thus, ammonia itself could be the cause for the workers' illnesses. Some cyanide probably combines with the calcium in the lime to form calcium cyanamide.

In the presence of heat and water, calcium cyanamide decomposes to form ammonia and hydrogen cyanide gas. Both of these compounds can cause headaches and nausea. The ammonia smell created by this reaction could mask the almond odor. Maximum concentrations levels for hydrogen cyanide and ammonia have been set by NIOSH at 5 and 35 milligrams per cubic meter, respectively (2.5 and 50ppm, respectively).

Some of this sludge was found in the creek by IDEQ. This sludge may have entered the creek during backwashing of the filter. If so, this would indicate poor operation of the unit. We may want to observe their operating procedures to see if their backwash water enters the creek or if they by-pass the filter during backwash.

As I understand it, we are to perform a preliminary assessment and inspection of Collis to determine if their waste management practices are adequate. This assessment will include a background document search and off-site reconnaissance. Off-site samples and effluent samples may or may not be taken. Steve Hoambrecker of IDEQ will assist us in this assessment. A meeting to discuss this project is tentatively scheduled for Monday morning.

E P A PROJECT

ECOLOGY AND ENVIRONMENT, INC.

MEMORANDUM: REGION VII

TO: Jim Buchanan

FROM: John Zirschky

DATE: October 23, 1980

SUBJECT: Work plan for Collis Manufacturing inspection during the week of November 3, 1980.

According to the information provided by Bill Keffer, we are to collect three samples from Collis Manufacturing. The first sample is to be taken from the effluent from the wastewater treatment system. The second sample is to be taken from the sludge dumpster, while the third sample should be collected from the sludge disposal pit. The treatment processes used by Collis were reviewed in an October 10, 1980 memo.

Workers contracted to clean out the sludge disposal pit during the first of the month were possibly affected by cyanide gas from the sludge pit. Cyanide gas can be absorbed through the skin or lung tissue; and therefore, conservative safety precautions are warrented. I recommend level B protection be worn; impervious clothing, boots, gloves, and SCBA when collecting samples from the sludge dumpster and sludge pit. I do not believe that the atmospheric concentration of cyanide is sufficient to warrent the use of a fully encapsulated suit. The affected workers were digging the pit for approximately 2 hours before they developed headaches and nausea.

The sampling team, probably Ken Snell and myself, should be in these areas no more than 20 minutes. A copy of the draft site safety plan is attached to this report.

The samples should be analyzed for metals, and cyanide at a minimum. Total chromium and hexavalent chromium analyses should be requested to determine the effectiveness of the chromium reduction operation. A field measurement of the pH of the discharge water should also be taken. A total priority pollutant analysis should not be necessary; however, sufficient sample volume should be collected in case EPA wants a full analysis.

Finally, we should observe Collis when they backwash their filter to see if sludge solids are discharged to the receiving water since lime sludge was observed in this creek. Steve Hoambrecker of IDEQ can assist us in this inspection; however, arrangements should be made at least one week in advance.

John Zirschky

JZ:mg
attachments

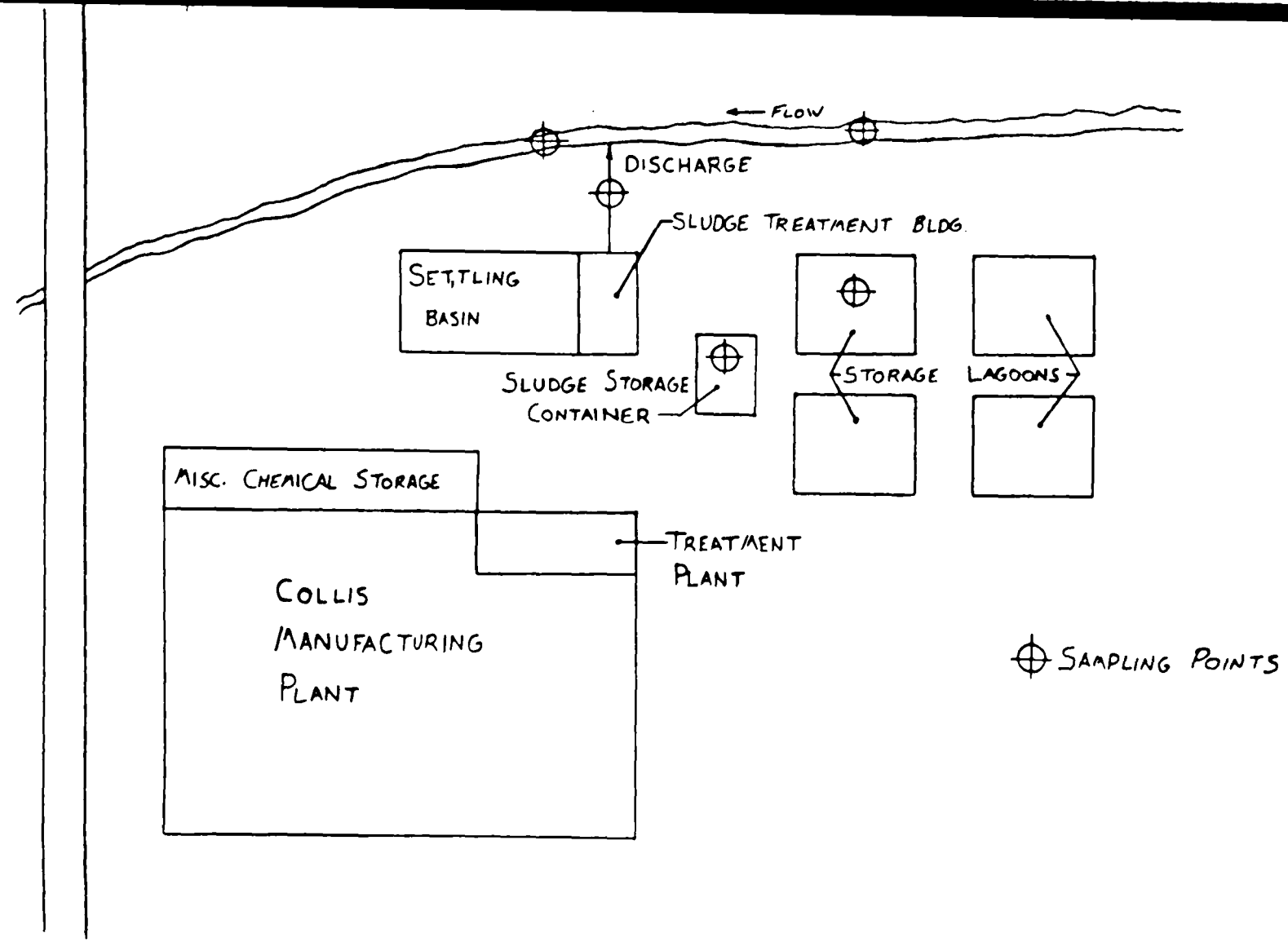


FIGURE 1. COLLIS MANUFACTURING SAMPLING POINTS

ECOLOGY & ENVIRONMENT, INC. FIELD INVESTIGATION TEAM

SITE SAFETY PLAN

SITE: Collin manufacturing
LOCATION: Clinton, Iowa

DATE: 10-23 80
PREPARER: JOHN FIRSCHKY
TDD NO.: F-7-8010-4

INVESTIGATIVE OBJECTIVE(S): _____

PROPOSED DATE OF INVESTIGATION: 11-5-80

BACKGROUND REVIEW: COMPLETE ☐ PRELIMINARY ☒
DOCUMENTATION/SUMMARY: OVERALL HAZARD SERIOUS ☐ MODERATE ☒ UNKNOWN

SITE/ WASTE CHARACTERISTICS

WASTE TYPE(S): LIQUID ☒ SOLID ☐ SLUDGE ☒ GAS ☐
CHARACTERISTIC(S): CORROSIVE ☐ IGNITABLE ☐ RADIOACTIVE ☐ VOLATILE ☐
TOXIC ☒ REACTIVE ☐ UNKNOWN ☐ OTHER ☐
FACILITY DESCRIPTION: SIZE unknown BUILDINGS _____

TOPOGRAPHY _____

PRINCIPAL DISPOSAL METHOD (type and location) _____

Outdoor sludge impoundment

UNUSUAL FEATURES (dike integrity, power lines, terrain, etc.) _____

STATUS (open, closed, unknown) _____

HISTORY (worker or non-worker injury; complaints from public; previous agency action): _____

Those involved in removing sludge from the Collin manufacturing & sludge bed were possibly affected by cyanide or ammonia poisoning

HAZARD EVALUATION

The sludge at the plant contains both cyanide and chlorine. As stated above, several persons may already have been poisoned by this waste. The workers, however, who were in the sludge bed for 2 hours before being noticeably affected. A strong ammonia smell was noticed by the workers before they became ill. Level B protection is recommended as cyanide gas can be absorbed through the skin. The concentrations and contact time with this gas would both be minimal, therefore, level B protection does not seem warranted. Cyanide Dragen tubes can be used to verify the concentration of HCN in the atmosphere, however, before sampling begins.

Cyanide prevents Oxygen transfer from blood to tissues causing suffocation

:. PERIMETER ESTABLISHMENT. MAP/SKETCH ATTACHED ☑ SITE CONTROL [
PUBLIC PERIMETER IDENTIFIED ☐ ZONE(S) OF CONTAMINATION IDENTIFI
NOTES:

areas of special safety concern identified

I. PERSONAL CLOTHING:

LEVEL OF PROTECTION: A ☐ B ☒ C ☐ D ☐
MODIFICATIONS:

SURVEILLANCE EQUIPMENT AND MATERIALS: Drager tubes will be used to check atmosphere HCN levels

I. DECONTAMINATION PROCEDURES:

HOT LINE LOCATION (initial):
COMMAND POST LOCATION (initial):
PERSONNEL STATIONS: 1. 2.
3. 4. 5.
EQUIPMENT AND MATERIALS/SPECIAL FACILITIES: Equipment will be wrapped in plastic and disposed of with the sludge or returned to Kansas City for decontamination.

IV. SITE ENTRY PROCEDURES:

TEAM SIZE: E & E 3 EPA ____ STATE 1 OTHER ____
ENTRY BRIEFING (date) 9:00 11-4-80 prior to entering site
STATION DESIGNATION (name/responsibility): 1. Jim BUCHANAN/FITL PTL
2. JOHN ZIRSCHKY/SAMPLE LEADER 3. KEN SNELL/ASSIST IN SAMPLING
4. Dave Hoambrecker/State of IOWA 5.
6. 7.
WORK SCHEDULE/LIMITATIONS: none

NOTES:

V. EMERGENCY PRECAUTIONS:

ACUTE EXPOSURE SYMPTOMS	FIRST AID
1. nausea	remove from area
2. headache	provide fresh air
3. dizziness	seek medical attention
4. blackout or fainting	immediately
5.	
6. OTHER	

HOSPITALS/POISON CONTROL CENTERS (address, telephone no.)

1. To be determined upon arrival
2.
3.
4.
5.

EMERGENCY TRANSPORTATION SYSTEMS (fire, police, ambulance)

1. To be determined upon arrival
2.
3.

VI. EMERGENCY ROUTES

1. To be determined upon arrival
2.
3.
4.

EQUIPMENT CHECKOUT

SCBA [X] CYLINDERS [X]
APR [ ] CARTRIDGES [ ]
EXPLOSIMETER [ ]
O_2 INDICATOR [ ]
DRAEGER PUMP [X] TUBES [X] HCN
RADIATION SURVEY METER [ ]
RADIATION CONTAMINATION METER [X] Dosimeter

EYE WASH UNIT [X]
FIRST AID KIT [X]
DRINKING WATER SUPPLY [ ]
PERSONAL CLOTHING [X]
DECONTAMINATION MATERIALS [X]